

Claims

1. Method for selecting a window size for a packet switched connection between a first and a second party, wherein a sending party uses a window based congestion control mechanism for avoiding or handling congestion on a communication path used for said connection, a window size defining the maximum number of data packets that can be sent by a sending party before an acknowledgement of the reception of a packet is received by said sending party, and wherein the following steps are performed when executing the method:
 - 5 - retrieving information about a bit rate of a link belonging to a path across which the connection between the parties is set up,
 - retrieving information about an estimation of a round trip time on the connection between the parties,
 - determining an estimation of a pipe capacity for the connection between the parties according to the retrieved bit rate and the round trip time of the connection,
 - 10 - determining an upper threshold value for the window size based on the pipe capacity, and
 - selecting a window size value above zero and below or equal to the upper threshold value.
2. Method according to claim 1, with the additional step of storing the selected window size together with an indication of the pipe capacity, or a predefined range of pipe capacities comprising the pipe capacity, of the connection.
- 20 3. Method according to claim 1 or 2, with the additional step of determining a destination of the connection, and wherein the selected window size is stored together with an identification of said destination.
- 25 4. Method according to claim 3, wherein the communication system is a cellular communication system and a destination is one of a location area, a routing area, a cell, a service area or an area served by a radio network controller, a mobile services switching centre, a radio base station or a serving general packet radio service support

node.

5. Method according to any of the preceding claims, wherein the communication system is a cellular communication system and the link is a wireless link.
6. Method according to any of the preceding claims, wherein a window is one of an initial window, a loss window or a restart window.
7. Method according to any of the preceding claims, wherein a party is one of a proxy server, a mobile user equipment, a radio network controller, a radio base station or a general packet radio service support node.
10. Method according to any of the preceding claims, wherein the upper threshold value is in a range of plus or minus two packets around twice the pipe capacity or twice the higher value of the predefined range of pipe capacities comprising the pipe capacity of the connection the window is used for.
9. Method according to any of the preceding claims with the additional steps of:
 - receiving a congestion indication for a connection before an acknowledgement for all packets sent in an initial window, a loss window, or a restart window, and
 - selecting a smaller window size.
15. Method according to claim 9, wherein the selected smaller window size is about half the size of the window size used before, unless the former window size was one.
10. Method according to any of the preceding claims, with the additional step of detecting an increase of the pipe capacity of a connection, and selecting a new window size for said connection, wherein the new congestion window size is one of an initial window size, a loss window size or a restart window size that are used for connections with the same pipe capacity or with a pipe capacity that falls into the same predefined range of pipe capacities as the increased pipe capacity, or wherein, if none of said initial window size, loss window size or restart window size is available, a value is selected that is n times the increased pipe capacity, with n greater than or equal to 1 and smaller than or
- 20.
- 25.

equal to 2.

12. Method according to claim 11, wherein a congestion window size for the connection is set to the selected window size value.
13. Method according to claim 11, wherein a slow start threshold value for the connection is set to the selected window size value.
5
14. Method according to any of the preceding claims with the additional steps of:
 - monitoring for a predefined number of seconds or number of connection set-ups or restarts that no congestion indication is received for a connection before an acknowledgement for all packets sent in an initial window, a loss window, or a restart window is received, and
10
 - selecting a larger window size that is smaller than or equal to the upper threshold value.
15. Method according to claim 14, wherein the selected larger window size differs from the window size used before by a predefined constant number.
16. Method according to claim 14 or 15, wherein the receiving of a congestion indication, the monitoring, and the selecting of a larger window size are performed separately for different destinations.
15
17. Method according to any of the preceding claims, wherein the selected window size is used for a further connection with the same pipe capacity or with a pipe capacity within
20 the same predefined range of pipe capacities, that is set-up or restarted.
18. Method according to any of the preceding claims, wherein the selected window size is used for a further connection with the same destination and the same pipe capacity or with a pipe capacity within the same predefined range of pipe capacities, that is set-up or restarted.
- 25 19. Window size selecting unit for a communication system for connecting a first and a

second party, wherein a sending party is adapted to use a window based congestion control mechanism for avoiding or handling congestion on a communication path, the window defining the maximum number of data packets that may be sent by a sender before an acknowledgement of the reception of a packet is received by the sender, and
5 wherein the window size selecting unit comprises an input/output unit for sending and receiving data, a processing unit for controlling the other units, *characterised, by* a selection unit for selecting a window size above zero and below or equal to an upper threshold value for a connection between the parties.

20. Window size selecting unit according to claim 18, further comprising a storage for
10 storing window sizes together with an information about a pipe capacity and a comparing unit for comparing stored pipe capacities and determined pipe capacities.
21. Window size selecting unit according to claim 20, further comprising a destination determining unit for determining a destination of a connection, wherein the storage is adapted to store an identification of a destination together with the window size and the
15 information about a pipe capacity, and wherein the comparing unit is adapted to compare stored destinations and determined destinations.
22. Threshold value determining unit comprising an input/output unit, a pipe capacity determining unit for determining a round trip time of a connection and a bit rate of said connection, and for determining the pipe capacity of said connection from the round trip time and the bit rate, and a processing unit for controlling the units and calculating an
20 upper threshold value for further use in a window size selecting unit.